R. Eric Collins, Ph.D.

Assistant Professor & Canada Research Chair in Arctic Marine Microbial Ecosystem Services
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Education and Research Experience

Canada Research Chair (Tier II) in Arctic Marine Microbial Ecosystem Services, Assistant Professor of Environment and Geography, University of Manitoba (2019–)

> **Arctic Marine Microbial Ecosystem Services**: I use long-read sequencing technologies and community based monitoring approaches to build local capacity for understanding the roles that microbes play in supporting and maintaining the health of people and communities.

Assistant Professor of Biological Oceanography, University of Alaska Fairbanks (2013–2019)

> **Arctic Microbial Communities**: I combined Arctic field work with next-generation sequencing techniques to explore the diversity, function, and evolution of microorganisms in ice and ice-covered oceans.

Postdoctoral Fellow in Astrobiology, McGill University (2012–2013)

> **Early Earth Genomics**: I used phylogenomic methods to search for genes specifically associated with sulfur isotope fractionation by sulfate reducing bacteria. PI: Dr. Boswell Wing

Postdoctoral Fellow in Astrobiology, McMaster University (2009–2012)

> **Genome Evolution**: I researched the evolution of microbes by comparative genomics and mathematical modeling. PIs: Dr. Paul Higgs, Dr. Greg Slater

Ph.D. Biological Oceanography, University of Washington (September 2009)

> **Microbial Evolution In Sea Ice—Communities To Genes**: I investigated the diversity of Bacterial and Archaeal communities in winter sea ice. Advisor: Dr. Jody W. Deming

Certificate in Astrobiology, University of Washington (2009)

> **In vitro microsensor measurements of AOM**: I used microsensors to measure the rate of anaerobic oxidation of methane (AOM) in microbial mats from the Black Sea. Advisors: Dr. Dirk de Beer (MPI-Bremen), Dr. Antje Boetius (MPI-Bremen)

M.S. Biological Oceanography, University of Washington (2006)

> **Microbial persistence over an Arctic winter season**: I investigated the abundances of bacteria, particles, and particulate extracellular polymeric substances (pEPS) in Arctic winter sea ice. Advisor: Dr. Jody W. Deming

B.S. Biochemistry with Honors, Washington State University (2002)

Training of HQP

Graduate Chair: Zakhar Kazmiruk (2022–) **PhD (in progress)** student working on Arctic microbial biodiversity and oil biodegradation in Arctic waters.

Graduate Chair: Thamali Vidanage (2023–) **MSc (in progress)** student working on community based monitoring of First Nations water.

Graduate Chair: Rei Shibue (2023–) **MSc (in progress)** student working on Arctic archaeal genomics.

Graduate Chair: Kari Green (2021–2023) **MSc (complete)** student working on Arctic Archaeal ecosystem services.

Graduate Chair: Patricia Montalvo (2019–2023) **MSc (complete elsewhere)** student worked on Arctic metagenomics.

Graduate Chair: Anais Gentilhomme (2018–2021) **MSc (complete)** student worked on psychrophile genomics.

Dr. Brandon Hassett (2017–2018) **Postdoctoral Fellow** worked on Arctic marine fungi.

Graduate Co-Chair: Rachel Lekanoff (2016–2020) **MSc (complete)** student worked on Arctic algal diversity.

Dr. Anne-Lise Ducluzeau (2014–2017) **Postdoctoral Fellow** worked on cold adaptation of Arctic microbes.

Undergraduate researchers: Riley de Blonde (2025–), Olivia Gies (2025–), Grace Oliver (2025–), Sophie Lakusta (2025–), Harvey Wastasecoot (2024–), Maria Garcia (2024–2025), Debosmitha Sen (2024–), Poorvang Patel (2024), Aditya Gandhi (2023–), Anna Shypilova (2023), Kallie Strong (2022), Jacob Janzen (2021), Elva House (2018), Madison Herron (2017–2018), Rei Shibue (2017), Jesse Klejka (2015), Kirsten Southerland (2015), Mattison Wade (2015), Quinn Demik (2014)

Teaching Experience, as Instructor

Fall 2023, Summer 2025: **ENVR4000 Field Course in Arctic Coastal Oceanography**: Field course in oceanography of coastal systems based on the M/V William Kennedy in the Hudson Bay Estuary. Co-taught with 3 other oceanographers. Enrollment 12–22.

Fall 2020-2023, Spring 2025: **ENVR3140 Aquatic Ecosystem Services**: Introduction to aquatic ecosystem services framework with an emphasis on the role of microbes in human well-being. **New course**. Enrollment 25.

Fall 2021-2023: **ENVR4140 Advanced Topics in Ecosystem Services**: Students read and discuss the primary literature in the field of Ecosystem Services and application of those principles to a final project. **New course**. Enrollment 10.

Fall 2018: **MSL492/692 Fisheries and Oceanography Seminar**: Departmental Seminar, organizing schedule and student mentorship. Enrollment 15.

Spring 2018: **BIOL342 General Microbiology**: An introduction to Microbiology covering environmental and human microbiology. Lab including isolation, complete genome sequencing, and bioinformatics analysis of student-collected microbes. Enrollment 45. **Revised lab**.

Autumn 2016: **MSL692 Controversies in Microbial Science**: A graduate seminar centered around unresolved controversies in the literature in the fields of microbial ecology and evolution. Addressed both scientific and ethical questions about microbes and the potential for their use and misuse by society. Enrollment 4. **New course**.

Autumn 2013–2019: **MSL449/650 Biological Oceanography**: This stacked course for senior undergraduates and graduate students was an introduction to biological oceanography covering primary production, phytoplankton diversity, the microbial loop, marine food webs, secondary production, zooplankton diversity, ecological modeling, and global biomes. Co-instructed with Russ Hopcroft. Enrollment 15. **Revised course**.

Spring 2016, 2018: **MSL493 Ecological and Evolutionary Genomics**: A hands-on bioinformatics course to develop skills in working with next-generation DNA sequencing data using modern computational tools. Targeted towards senior undergraduates and graduate students in the biological and natural sciences. Enrollment 6. **New course**.

Autumn 2015: **MSL699 Sea Ice Ecology**: A seminar designed to introduce graduate students to the full diversity of life associated with sea ice and ice-covered waters by reading contemporary scientific literature and interacting directly with the authors of the papers to better understand the process of science. Enrollment 6. **Redesigned course**.

Spring 2015–2017: **MSL294 Astrobiology**: An introduction to science for non-science majors, this course touched on cosmology, astronomy, planetary science, geology, chemistry, biology, oceanography, and philosophy during a wide-ranging investigation into what scientists have learned while asking the question 'Are We Alone?'. Enrollment 10. **New course**.

Spring 2013: **MSL649 Field Techniques in Interdisciplinary Sea Ice Research**: Instructor for 10-day field course in Barrow, Alaska, included participants from the US, Japan, Korea, Switzerland, Austria, Germany, and New Zealand. Topics included sea ice biology, chemistry, geophysics, remote sensing. Co-instructed with Hajo Eicken, Rolf Gradinger and others. Enrollment 22.

Other Teaching Experience

Summer 2020: **Bioinformatics Virtual Coordination Network**: Developed and delivered a bioinformatics curriculum for online teaching during the pandemic with a network of other instructors. Led the Metagenomics Topic, including synchronous and asynchronous video lectures and hands-on coding tutorials. Viewed over 2000 times.

Summer 2014: **AB-330 Ecosystems in Ice Covered Waters**: Guest lecturer at the University Centre in Svalbard in a course to study the structure and dynamics of ecosystems with the sea-ice system as a model unit. Instructor Janne Sørreide. Enrollment 30.

Winter 2011: **Environmental Genomics Workshop**: Designed and delivered two-day workshops on Web-Enabled Environmental Genomics and Metagenomics at McGill University in Montreal, Canada. Course participants included students, postdocs, and faculty from microbiology, geochemistry, and oceanography. Course wiki: `http://openwetware.org/wiki/User:R._Eric_Collins/GenomicsTutorial`. Enrollment 16.

2010–2011: **Astrobiology Journal Club**. Organizer of a bi-weekly meeting of undergraduates, graduate students, postdocs and faculty members on topics as diverse as the bioenergetic control of microbial genome size to the presence of methane on Mars. Guest lecturer in 'Life in the Universe' course. Enrollment 8.

Autumn 2008: **Oceanography 430: Senior undergraduate core course in Biological Oceanography**. Teaching Assistantship. Led weekly review sessions and gave lectures. Assisted in adaptation of curriculum towards discovery-based learning approaches. Enrollment 20.

Winter/Spring 2008: **Oceanography 443/444: Senior undergraduate thesis course**. Teaching Assistantship. Mentored students in the development and execution of individual research projects which were then carried out aboard the R/V Thomas G. Thompson in March 2008. Enrollment 20.

Spring 2007: **Communicating Ocean Sciences outreach course**. Constructed and presented pre-planned kits for science outreach to 2nd grade classroom, then designed, constructed, presented, and evaluated implementation of a new kit with a team member.

Autumn 2005: **Astrobiology Exchange Workshop** at Friday Harbor Labs. Planning and execution of 4-day hands-on scientific workshop involving ∼20 students and faculty from the Astrobiology programs at the University of Washington and the University of Arizona.

Spring 2004: **Oceanography 101: Introduction to Oceanography**. Teaching Assistantship. Lectured and taught lab sections for non-majors, culminating in a research cruise in Puget Sound. Enrollment 45.

Funding

Pending: **PI**. Canada Research Chair in Aquatic Microbial Ecosystem Services. 2025–2030. $500,000. NSERC.

Awarded: **Co-I**. (PI: CJ Mundy). A community-based monitoring study of biogeochemical processes operating across the Churchill River estuarine gradient. $150,000. Oceans North.

Awarded: **PI**. Co-developing Indigenous Environmental Knowledge Curriculum through Relationship-Building. $2,000. UM Faculty Development Initiative.

Pending: **PI**. Aquatic Microbial Ecosystem Services. 2025–2030. $500,000. Canada Research Chair Tier 2 Renewal.

Not Awarded: **PI**. Reinforcement Learning by Indigenous Feedback. 2025–2027. $100,000. Future of Life Institute.

Not Awarded: **PI**. Genomics Informed Monitoring of Freshwater Quality in the Kivalliq Region Using eDNA. 2025–2030. $100,000. Nunavut General Monitoring Plan.

Not Awarded: **PI**. Bioaugmentation as an Alternative Response Measure for the Natural Attenuation of Oil in Icy Waters. 2025–2027. $100,000. DFO Ecosystems and Oceans Science.

Not Awarded: **PI**. Mino-Bimaadiziwin: Nurturing Life Through Indigenous Stewardship. 2025–2026. $10,000. UM University Indigenous Research Program Connection Grant.

Awarded: **Co-I**. (PI: Zou Zou Kuzyk). Connecting Waters, Protecting Lands: Monitoring Partnerships for Communities and Conservation Outcomes in southern Hudson Bay and James Bay. 2025–2031. $500,000. DFO Ecosystems and Oceans Science.

Awarded: **Co-I**. (PI: Stephane McLachlan). The Wa Ni Ska Tan Alliance of Hydro-Impacted Communities: Shifting from Impacts to Indigenous-Led Solutions. 2025–2031. $20,000. SSHRC Partnership Grants.

Awarded: **PI**. PrairieDNA: Prairies North Environmental DNA Monitoring Network. 2025–2027. $380,000. Genome Canada.

Not Awarded: **Co-I**. (PI: Aimée Craft). Decolonizing Water: International, inter-jurisdictional and Indigenous approaches to decolonial and collaborative water governance. 2025–2031. $22,000,000. NFRF-Transformation.

Awarded: **Co-I**. (PI: Stephane McLachlan). kayask kiskethitamowinah: Learning from our past. 2025–2030. $400,000. SSHRC Insight.

Awarded: **Co-I**. (PI: Dorthe Dahl-Jensen). Dynamics of freshwater and sea ice in the Queen Elizabeth Islands. 2025. $240,000. NSERC STAC.

Awarded: **Co-I**. (PI: Dorthe Dahl-Jensen). Research Cruise into the Queen Elizabeth Islands. 2025. $640,000. Amundsen Science.

Awarded: **PI**. Water Mass Tracking Using Microbial Genomics. 2024–2026. $50,000. Dahl-Jensen CERC Program.

Awarded: **Co-I**. (PI: Dorthe Dahl-Jensen). Green2Ice. 2023–2029. $73,000. European Research Council Synergy.

Not Awarded: **PI**. Co-Developing a Community Based Aquatic Monitoring Network in Kivalliq. 2024–2027. $448,500. Polar Knowledge Canada.

Awarded: **Co-I**. (PI: Stephane McLachlan). Indigenous CREATE: Mentoring and Training the Next Generation of Environmental Researchers Working in the Indigenous North. 2023–2029. $1,650,000. NSERC Collaborative Research and Training Experience. Support for 2 students.

Not Awarded: **Co-I**. (PI: Nicole Wilson). Sapujiyiit ("Guardians of the Sea"): Co-developing sustainable genomics-informed community-based monitoring in the Foxe basin. 2023–2029. $198,240.

Not Awarded: **PI**. Freshwater-Marine Oil Spill Ecology Observing and Monitoring Network. 2023–2026. $2,906,987. NRC Multi Partner Research Initiative.

Awarded: **PI**. Microbial degradation of land-derived organic matter and oil in the coastal waters of the Arctic Ocean. 2023–2024. $4,180. Polar Knowledge Canada.

Awarded: **PI**. Ecology and Evolution of Arctic Marine Microbial Communities. 2022–2027. $140,000. NSERC Discovery Grant. Support for 2 students.

Not Awarded: **Co-I** (PI: Feiyue Wang). TransARCTIC: Achieving safe and sustainable marine shipping in the Arctic Canada via co-developed policies and technologies. 2022–2028. $24,000,000. NFRF-Transformation.

Awarded: **Co-PI** (Co-PI: Gary Stern). Reimagining Monitored Natural Attenuation for the Remediation of Oil Spilled in Ice-covered Waters. 2021–2025. $6,000,000. Genome Canada LSARP. Support for 2 students.

Not Awarded: **Co-I** (PI: Feiyue Wang). TransARCTIC: Co-developing knowledge and technologies to detect, reduce, and mitigate marine transportation-related hazards in a rapidly opening Arctic. 2021–2027. $24,000,000. NFRF-Transformation.

Awarded: **PI** (Co-I: Gary Stern). Arctic coastal community-based prediction of oil biodegradation potential using real-time DNA sequencing and machine learning. 2020-2022. $250,000. NSERC NFRF-Exploration. Support for 2 students.

Awarded: **PI**. Canada Research Chair in Arctic Marine Microbial Ecosystem Services. 2019–2024. $600,000. NSERC. Support for 3 students.

Awarded: **PI**. Biospatial Mapping of Arctic Marine Microbial Communities. 2020–2021. 300 core years. Compute Canada.

Awarded: **PI**. Water is Life/Water is Alive. 2019–2021. $20,000. North Pacific Research Board.

Awarded: **PI**. Hot spots of activity in the cold ocean: Ecological characterization of size-fractionated microbial communities. 2018–2020. $175,000. North Pacific Research Board. Support for 1 MS.

Awarded: **PI**. Advancing Machine Learning in Biological Oceanography Through Interdisciplinary Collaborations. 2018–2020. $187,000. NSF EPSCoR. Support for 1 MS.

Awarded: **PI** (Co-I: Katrin Iken). The Chukchi Borderlands – Navigating the Hidden Microbial Network in Sea Ice. NOAA Ocean Exploration and Research. 2015–2018. $150,000. NOAA Ocean Exploration and Research. Support for 1 technician.

Awarded: **PI** (Co-I: Anne-Lise Ducluzeau). PhArcO: Pharmacopoeia of the Arctic Ocean. INBRE Bioinformatics Award. 2015–2016. $6,000.

Awarded: **Co-PI** (Co-PIs: Russ Hopcroft, Katrin Iken). Request for support of US participation in CBMP Expert Networks. NOAA/CIFAR. 2015–2017. $30,000.

Awarded: **Co-I** (PI: Katrin Iken). Arctic Marine Biodiversity Observing Network. National Ocean Partnership Program (NOAA, BOEM, Shell). 2015–2020. $4,242,000. Support for 1 PhD.

Awarded: **PI** (Co-Is: Rolf Gradinger, Hajo Eicken). Crude Oil Infiltration and Movement in First Year Sea Ice: Impacts on Ice-Associated Biota and Physical Constraints. Coastal Marine Institute/BOEM. 2014–2017. $596,000. Support for 1 MS, 1 PhD.

Awarded: **PI** (Co-I: Sarah Hardy). Mapping the Uncharted Diversity of Arctic Marine Microbes. NOAA Ocean Exploration and Research. 2014–2017. $289,000. Support for 1 MS.

Awarded: **PI** (Co-I: Rolf Gradinger). The Diversity, Seasonality, and Function of Parasitic Fungi in Arctic Sea Ice. NSF Arctic Natural Sciences. 2014–2018. $550,000. Support for 1 MS, 1 PhD, 1 postdoc.

Awarded: **PI** (Co-PI: Jody Deming). Collaborative Research: Seasonal Synergy Between Bacterial Osmoprotection and Algal Production in Sea Ice. NSF Arctic Natural Sciences. 2012–2016. $230,000. Support for 1 postdoc.

Awarded: **Co-I** (PI: Mary Beth Leigh). Bringing Next-Generation Sequencing Technology to the University of Alaska. Murdock Foundation. 2014–2016. $110,000.

Awarded: **PI** (Co-I: Mary Beth Leigh). Bringing Next Generation DNA Sequencing Technology to UAF. UAF Technology Advisory Board. 2014–2015. $50,000.

Awarded: **PI** (Co-I: Anne-Lise Ducluzeau). Potential for quinone regulation of membrane fluidity in marine microbes. Gordon and Betty Moore Foundation. 2014–2016. $15,000.

Awarded: **PI** (Co-I: Boswell Wing). Unraveling the genetic basis of an ancient geochemical biomarker. DOE Joint Genome Institute. 2011–2016. In-kind sequencing.

Publications

Collins RE, Stern G (2024) Searching for ways to address disasters in the Arctic. The Circle 3:25-27. World Wildlife Fund.

Rapp J, Eronen-Rasimus E, Deming JW, **Collins RE** (in press). Phyloecology of Sea Ice Bacteria and Archaea. Sea Ice 4th Ed. (Ed. D Thomas).

Loutet S, Sanger A, Strong K, **Collins RE**, Mahmoudi N (2025) Microbial community dynamics amidst rapid environmental changes in the Hudson Bay Marine System. Canadian Journal of Microbiology. doi:10.1139/cjm-2024-0154

Saltymakova D, Desmond D, Smith AF, Bautista MA, **Collins RE**, Polcwiartek K, Snyder N, Wolfe T, Hubert C, Isleifson D, Stern G (2025) Enhanced crude oil degradation observed in sea ice following bioaugmentation with arctic bacteria. Marine Environmental Research. doi:10.1016/j.marenvres.2024.106942

Gentilhomme A, Sweet C, Hennon GM, **Collins RE** (2024) Genomic signatures of cold adaptation in the family Colwelliaceae. Extremophiles. 28(3):39.

Tully BJ, Buongiorno J, Cohen AB, Cram JA, Garber AI, Hu SK, Krinos AI, Leftwich PT, Marshall AJ, Sieradzki ET, Speth DR, Suter EA, Trivedi CB, Valentin-Alvarado LE and Weissman J, **BVCN Instructor Consortium** (2021) The Bioinformatics Virtual Coordination Network: An Open-Source and Interactive Learning Environment. Frontiers in Education 6:711618. doi: 10.3389/feduc.2021.711618

Dilliplaine K, Oggier M, **Collins RE**, Eicken H, Gradinger R, Bluhm BA (2021) Crude oil exposure reduces ice algal growth in a sea-ice mesocosm experiment. Polar Biology 44:525-37.

Mueter FJ, Iken K, Cooper LW, Grebmeier JM, Kuletz KJ, Hopcroft RR, Danielson SL, **Collins RE**, Cushing DA (2021) Changes in diversity and species composition across multiple assemblages in the eastern Chukchi Sea during two contrasting years are consistent with borealization. Oceanography 34:38-51.

Eronen-Rasimus E,Hultman J, Hai T, Pessi IS, **Collins E**, Wright S, Laine P, Viitamäki S, Lyra C, Thomas DN, Golyshin PN, Luhtanen A,Kuosa H, Kaartokallio H (2021). Sea-Ice Bacteria Halomonas sp. Strain 363 and Paracoccus sp. Strain 392 Produce Multiple Types of Poly-3-Hydroxyalkaonoic Acid (PHA) Storage Polymers at Low Temperature. Applied and Environmental Microbiology 87:e00929-21.

Bowman KL, **Collins RE**, Agather AM, Lamborg CH, Hammerschmidt CR, Kaul D, Dupont CL, Christensen GA, Elias DA (2019) Distribution of mercury-cycling genes in the Arctic and equatorial Pacific Oceans and their relationship to mercury speciation. Limnology and Oceanography 65:S310-S320.

Kasanke C, **Collins RE**, Leigh MB (2019) Identification and Characterization of a Dominant Sulfolane-Degrading Rhodoferax spv̇ia Stable Isotope Probing Combined with Metagenomics. Scientific Reports 9:1-9.

Ducluzeau AL, Tyson JR, **Collins RE**, Snutch TP, Hassett BT (2018) Genome Sequencing of Sub-Arctic Mesomycetozoean Sphaeroforma sirkka Strain B5, Performed with the Oxford Nanopore minION and Illumina HiSeq Systems. Microbiology Resource Announcements 7:e00848-18.

Bluhm BA, Hop H, Melnikov IA, Poulin M, Vihtakari M, **Collins RE**, Gradinger R, Juul-Pedersen T, von Quillfeldt C (2017) **Chapter 3.1 Sea Ice Biota**. In *State of the Arctic Marine Biodiversity Report*. Conservation of Arctic Flora and Fauna.

Fuchsman CA, **Collins RE**, Rocap G, Brazelton WJ (2017) **Effect of the environment on horizontal gene transfer between bacteria and archaea**. PeerJ 5, e3865. doi:10.7717/peerj.3865

Deming JW, **Collins RE** (2017) **Sea Ice as a Habitat for Bacteria, Archaea and Viruses**. In *Sea Ice, 3rd Edition*, D Thomas *Ed.*. John Wiley & Sons, Ltd.

Moyer CL, **Collins RE**, Morita RY (2017) **Psychrophiles and Psychrotrophs**. Encyclopedia of Life Sciences. doi:10.1016/B978-0-12-809633-8.02282-2

Hassett BT, Ducluzeau AL, **Collins RE**, Gradinger R (2017) **Spatial distribution of aquatic marine fungi across the western Arctic and sub-Arctic**. Environmental Microbiology 19:475–484. doi:10.1111/1462-2920.13371

Firth E, Carpenter SD, Sørensen HL, **Collins RE**, Deming JW (2016). **Bacterial use of choline to tolerate salinity shifts in sea-ice brines**. Elementa: Oceans. *Open Access.* doi:10.12952/journal.elementa.000120

Collins RE (2016) **Microbial Evolution in the Cryosphere**. In *Microbial Evolution Under Extreme Conditions*, C Bakermans *Ed.* De Gruyter, Berlin. doi:10.1515/9783110340716.31

Kopf A, Bicak M, and 148 co-authors including **Collins RE** (2015) **The ocean sampling day consortium**. GigaScience 4:1–5. *Open Access.* doi:10.1186/s13742-015-0066-5

Eicken H, Bluhm BA, **Collins RE**, Gradinger RR, Haas C, Ingham M, Mahoney A, Nicolaus M, Perovich D (2015) **Field Techniques in Sea-Ice Research**. In *UNESCO Encyclopedia of Life Support Systems*. Cold Regions Science and Marine Technology.

Miller LA, Fripiat F, Else BGT, Bowman JS, Brown KA, **Collins RE**, Ewert M, Fransson A, Gosselin M, Lannuzel D, Meiners KM, Michel C, Nishioka J, Nomura D, Papadimitriou S, Russell LM, Sørensen LL, Thomas DN, Tison J-L, van Leeuwe MA, Vancoppenolle M, Wolff EW, Zhou J (2015) **Methods for biogeochemical studies of sea ice: The state of the art, caveats, and recommendations**. Elementa: Oceans 3:000038. *Open Access.* doi:10.12952/journal.elementa.000038

Collins RE, Deming JW (2013) **An inter-Order horizontal gene transfer event enables the catabolism of compatible solutes by *Colwellia psychrerythraea* 34H**. Extremophiles 17:601–610. *Open Access.* doi:10.1007/s00792-013-0543-7

Collins RE, Higgs PG (2012) **Testing the Infinitely Many Genes model for the bacterial core genome and pangenome**. Molecular Biology and Evolution 29:3413–3425. *Open Access.* doi:10.1093/molbev/mss163

Collins RE, Higgs PG (2011) **Origin and Evolution of Gene Families in Bacteria and Archaea**. BMC Bioinformatics 12(Suppl 9):S14. *Open Access.* doi:10.1186/1471-2105-12-S9-S14

Collins RE, Deming JW (2011) **Abundant dissolved genetic material in Arctic sea ice, Part I: Extracellular DNA**. Polar Biology 34:1819–1830. doi:10.1007/s00300-011-1041-y

Collins RE, Deming JW (2011) **Abundant dissolved genetic material in Arctic sea ice, Part II: Viral dynamics during autumn freeze-up**. Polar Biology 34:1831–1841. doi:10.1007/s00300-011-1008-z

Miller LA, Papakyriakou TN, **Collins RE**, Deming JW, Ehn, JK, Macdonald RW, Mucci A, Owens O, Raudsepp M, and N Sutherland (2011) **Carbon dynamics in sea ice: A winter flux time series**. Journal of Geophysical Research 116:C02028. doi:10.1029/2009JC006058

Collins RE, Rocap G, Deming JW (2010) **Persistence of bacterial and archaeal communities in sea ice through an Arctic winter**. Environmental Microbiology 7:1828–1841. *Open Access.* doi:10.1111/j.1462-2920.2010.02179.x

Collins RE, Carpenter S, Deming JW (2008) **Spatial and temporal dynamics of particles, bacteria, and extracellular polymeric substances in Arctic winter sea ice**. Journal of Marine Systems 74:902–917. doi:10.1016/j.jmarsys.2007.09.005

Collins RE, Rocap G (2007) **REPK: an analytical web server to select restriction endonucleases for terminal restriction fragment length polymorphism analysis**. Nucleic Acids Research 35 (Database issue): W58–W62. *Open Access.* doi:10.1093/nar/gkm384

Ehlmann BL, Chowdhury J, Marzullo TC, **Collins RE**, Litzenberger J, Ibsen S, Krauser WR, DeKock B, Hannon M, Kinnevan J, Shepard R, Grant FD (2005) **Humans to Mars: a feasibility and cost-benefit analysis**. Acta Astronautica 56:851. doi:10.1016/j.actaastro.2005.01.010

Costa MA, **Collins RE**, Anterola AM, Cochrane FC, Davin LB, Lewis NG (2003) **An in silico assessment of gene function and organization of the phenylpropanoid pathway metabolic networks in *Arabidopsis thaliana* and limitations thereof**. Phytochemistry 64:1097-1112. doi:10.1016/S0031-9422(03)00517-X

Presentations

A Edwardson, H King, **RE Collins** (accepted) My Atiq's Favorite: Decolonization in Art and Science. Arctic Science Summit Week 2025. Oral.

ZV Kazmiruk, **RE Collins**, ZZ Kuzyk (accepted) Intensification of Apparent Oxygen Utilization Signal Over 50 Years in Hudson Bay. Arctic Science Summit Week 2025. Oral.

TU Vidanage, **RE Collins** (2024) Biodegradation efficiency of crude oil by Hydrocarbonoclastic bacteria in Marine Oil Snow (MOS) and subsequent water phase in the Canadian Arctic: A microcosm case study. Arctic Change 2024. Poster.

A Edwardson (2024) Creative Decolonization in the Sciences. Insight Workshops. Organizer.

J Enright (2024) Neurodiversity in the Sciences. Insight Workshops. Organizer.

RE Collins (2024) Arctic Marine Microbial Ecosystem Services. UM Microbiology Seminar Series, Canada. **Speaker**.

RE Collins (2024) Arctic Marine Microbial Ecosystem Services. Manitoba Environment and Climate Change Seminar Series, Canada. **Speaker**.

RE Collins for the GENICE II Team (2024) GENICE II: Reimagining Monitored Natural Attenuation as an Oil Spill Response Tool in the Arctic. Genome Prairie Ministerial Meeting, Canada. **Speaker**.

RE Collins for the GENICE II Team (2024) GENICE II: Reimagining Monitored Natural Attenuation as an Oil Spill Response Tool in the Arctic. Churchill Barber Symposium, Canada. **Speaker**.

RE Collins for the GENICE II Team (2024) GENICE II: Reimagining Monitored Natural Attenuation as an Oil Spill Response Tool in the Arctic. Prairie and Northern Region Canadian Marine Advisory Council, Canada. **Speaker**.

RE Collins for the GENICE II Team (2024) GENICE II: Reimagining Monitored Natural Attenuation as an Oil Spill Response Tool in the Arctic. Chesterfield Inlet Community Co-Development Workshop, Canada. **Speaker**.

RE Collins (2024) Review of "State of Knowledge on the Natural Attenuation of Oil in Canadian Environments". Canadian Science Advisory Secretariat Panel, Canada. **Speaker**.

RE Collins (2024) Genomics-Informed Environmental Monitoring with Nanopore Sequencing. Helsinki Nanopore Workshop, Finland. **Speaker**.

RE Collins (2024) Arctic Marine Microbial Communities. FoxSIPP Project Meeting, Canada. **Speaker**.

RE Collins (2023) GENICE II: Reimagining Monitored Natural Attenuation as an Oil Spill Response Tool in the Arctic. Chesterfield Inlet Community Co-Development Workshop, Canada. **Speaker**.

RE Collins for the GENICE II Team (2023) GENICE II: Reimagining Monitored Natural Attenuation as an Oil Spill Response Tool in the Arctic. GENICE II Research Oversight Committee, Canada. **Speaker**.

RE Collins (2023) Arctic Marine Microbial Ecosystem Services. Canada Research Chairs Forum, Canada. **Speaker**.

K Strong, **RE Collins** (2023) Microbial Community Monitoring on Lake Winnipeg. Lake Winnipeg Research Consortium Science Workshop, Canada. **Oral**.

K Green, **RE Collins** (2023) Searching for signatures of cold-adaptation in metagenome assembled genomes of Arctic Archaea. Gordon Research Conference, USA. **Poster**.

K Green, **RE Collins** (2023) Using Amino Acid metrics to understand cold- and host-adaptation in nitrifying Thaumarchaeota. Canadian Society for Microbiology, Canada. **Oral**.

Z Kazmiruk, **RE Collins** (2023) Comparative metagenomics study reveals adaptation of the Arctic marine microbiome to the increasing presence of terrestrial organic matter. EGU, Austria. **Oral**.

R Shibue, **RE Collins** (2023) Microbial Community Structure in the Distributed Biological Observatory. Pacific Arctic Group Meeting, Japan. **Oral**.

RE Collins (2023) Redrawing the Map of Arctic Marine Microbial Diversity. Environment and Geography Seminar Series, Canada. **Speaker**.

RE Collins (2023) Planet Microbe. GEOG7440 Guest Lecture, Canada. **Speaker**.

RE Collins (2022) GENICE II: Reimagining Monitored Natural Attenuation as an Oil Spill Response Tool in the Arctic. Chesterfield Inlet Community Co-Development Workshop, Canada. **Speaker**.

J Cohen, M Brauner, **RE Collins**, G Hennon (2022) Investigating the Impact of the 2019 Marine Heatwave on Microbial Community Composition in the Gulf of Alaska. Alaska Marine Science Symposium, Canada. **Oral**.

K Green, **RE Collins** (2022) Genomic characterization and identification of cold-adaptation signatures in metagenomic assembled genomes of Archaea from Western Arctic seawater. Canadian Society for Microbiology, Canada. **Oral**.

K Green, **RE Collins** (2022) The search for novel Archaea in an ever changing Arctic. Polar Microbes Symposium, Finland. **Oral**.

P Montalvo-Rodriguez, **RE Collins** (2022) Living together: Determining biogeographical patterns and co-occurrence of microbial eukaryotes and prokaryotes in the Chukchi Sea. Polar Microbes Symposium, Finland. **Oral**.

K Green, **RE Collins** (2022) Genomic Characterization and Identification of Cold-Adaptation Signatures in Metagenomic Assembled Genomes of Archaea from Western Arctic Seawater. ArcticNet Science Meeting, Canada. **Oral**.

K Green, **RE Collins** (2022) Identification of Cold-Adaptation signatures in metagenomics assembled genomes of Archaea. Polar and Alpine Microbiology, Germany. **Oral**.

P Montalvo-Rodriguez, **RE Collins** (2022) To be or not to be free-living: Determining microbial community lifestyle and dynamics in the Chukchi Sea. ArcticNet Science Conference. **Poster**.

Z Kazmiruk, **RE Collins** (2022) Prokaryotic communities in the Chukchi, Bering, and Barents Seas. Polar Microbes Symposium, Finland. **Oral**.

RE Collins for the GENICE II Team (2022) GENICE II: Reimagining Monitored Natural Attenuation as an Oil Spill Response Tool in the Arctic. Hudson Bay Summit, Canada. **Poster**.

RE Collins for the GENICE II Team (2022) GENICE II: Reimagining Monitored Natural Attenuation as an Oil Spill Response Tool in the Arctic. GENICE II Research Oversight Committee, Canada. **Speaker**.

Eronen-Rasimus E, **Collins RE** (2022) Second Polar Microbes Symposium, Tvarminne, Finland. **Conference Organizer**.

RE Collins (2021) Lake Winnipeg Plankton. Brokenhead Ojibway Nation STEM Camp, Canada. **Speaker**.

RE Collins (2021) Arctic Marine Microbial Ecosystem Services. OHSU Seminar Series, USA. **Speaker**.

RE Collins (2020) Metagenomics and Bioremediation. BIOL4000 Guest Lecture, Canada. **Speaker**.

RE Collins (2020) Metagenomics Lesson 5: Sequence Assembly. Bioinformatics Virtual Coordination Network, Canada. **Speaker**.

RE Collins (2020) Metagenomics Lesson 3: Taxonomic Classification with MinHash. Bioinformatics Virtual Coordination Network, Canada. **Speaker**.

RE Collins (2020) Metagenomics Lesson 2: Taxonomic Classification with k-mers. Bioinformatics Virtual Coordination Network, Canada. **Speaker**.

RE Collins (2020) Metagenomics Lesson 1: What is Metagenomics? Bioinformatics Virtual Coordination Network, Canada. **Speaker**.

Gentilhomme A, Sweet C, Hennon GM, **Collins RE** (2024) Predicting Optimal Growth Temperatures of Colwellia spp. Using Genetic Signatures. Ocean Sciences Meeting, USA. **Poster**.

Collins RE (2020) Revealing Ecosystem Services Driven by Hidden Microbial Networks. Microbial Mixtures Workshop, Ottawa, Canada. **Invited Speaker**.

Collins RE (2019) Metagenome-assembled genomes of Bacteria, Archaea, viruses and Picoeukaryotes from Arctic sea ice. International Glaciological Society, Winnipeg, Canada. **Speaker**.

Collins RE, Eronen-Rasimus E (2019) Sea ice habitats and ecological processes across multiple scales. International Glaciological Society, Winnipeg, Canada. **Session Organizer**.

Gentilhomme A, Sweet C, Hennon GM, **Collins RE** (2019) Predicting Optimal Growth Temperatures of Colwellia spp. Using Genetic Signatures. Astrobiology Science Conference, USA. **Poster**.

Eronen-Rasimus E, **Collins RE** (2018) Polar Microbes Symposium, Tvarminne, Finland. **Conference Organizer**.

Bowman J, Corsaro M, Deming JW, **Collins RE**, Dinasquet J, Tutino L (2018) BE-3 Polar perspectives on microbial evolution, adaptation, and ecological function. POLAR 2018, Davos, Switzerland. **Session Organizer**.

Eronen-Rasimus E, **Collins RE**, Karkman A, Hultman J, Autio R, Rintala J-M, Kaartokallio, H (2018) Biogeography of sea-ice bacteria. ISME 2018, Leipzig, Germany. **Poster**.

Collins RE (2018) SEDNA: A Google Earth for Microbes. ISME 2018, Leipzig, Germany. **Poster**.

Collins RE (2018) Mapping the Uncharted Diversity of Arctic Marine Microbes. Polar Microbes Symposium, Tvarminne, Finland. **Oral**.

Lekanoff RM, O'Daley S, Collins RE, McDonnell AMP (2018) Characterizing particle-associated and free-living microbes and their roles in the carbon cycle of the Bering and Chukchi seas. Alaska Marine Science Symposium 2018, Anchorage, AK. **Poster**.

Weaver T, Berger J, Biddle J, **Collins RE**, Cooper Z, Deming JW (2018) Sonification of Deep Ocean Microbial Ecology (soniDOME). POLAR 2018, Davos, Switzerland. **Poster**.

Lekanoff RM, O'Daley S, Collins RE, McDonnell AMP (2018) Characterizing particle-associated and free-living microbes and their roles in the carbon cycle of the Bering and Chukchi seas. Ocean Sciences Meeting 2018, Portland, OR. **Poster**.

Collins RE (2017) SEDNA: A Visual Framework for the Analysis of Microbial Diversity and Phenotypes. Ocean Sciences Meeting 2018, Portland, OR. **Poster**.

Morton P, Twining B, Rauschenberg S, **Collins RE** (2018) Influence of Brine Release and Sea Ice Melt on Particulate Trace Element Biogeochemistry. Ocean Sciences Meeting 2018, Portland, OR. **Poster**.

Ulaski B, **Collins RE** (2017) A Molecular Assessment of Marine Bacterial and Protist Communities Within Two Gateways to the Arctic Ocean. Aquatic Sciences Meeting 2017, Honolulu, HI. **Poster**.

Ducluzeau AL, Hassett BT, Herriott IC, **Collins RE** (2017) The genome of the Sea Ice Flavobacterium Polaribacter sp. 11 emphasizes the bioenergetic diversity of the Polaribacter genus. Aquatic Sciences Meeting 2017, Honolulu, HI. **Poster**.

Collins RE, Weisen R, Dilliplaine K, Morton P (2017) Microbe-metal interactions in the central Arctic Ocean. Aquatic Sciences Meeting 2017, Honolulu, HI. **Poster**.

Hassett BT, Ducluzeau AL, **Collins RE**, Gradinger R (2017) Fungi: A missing link to Arctic marine carbon cycling. Aquatic Sciences Meeting 2017, Honolulu, HI. **Poster**.

Ulaski B, **Collins RE** (2017) A molecular assessment of marine bacterial and protist communities within two gateways to the Arctic Ocean. Alaska Marine Science Symposium, Anchorage, AK. **Poster**.

Collins RE (2016) Redrawing the Map of Arctic Marine Microbes. American Society for Microbiology Alaska Branch, Fairbanks, AK. **Speaker**.

Ducluzeau AL, Hassett BT, Herriott IC, **Collins RE** (2017) The genome of the Sea Ice Flavobacterium Polaribacter sp. 11 emphasizes the bioenergetic diversity of the Polaribacter genus. American Society for Microbial Alaska Branch, Fairbanks, AK. **Poster**.

Collins RE (2016) Evolution and metabolism in heterotrophic sea ice bacteria. Workshop on the Biogeochemistry of Sea Ice, With a Focus on the Arctic, Gothenburg, Sweden. **Invited Speaker**.

Collins RE (2016) Adaptive Changes in the Inferred Proteomes of Dominant Bacterial Clades in the Global Ocean. Ocean Sciences Meeting, New Orleans, LA. **Poster**.

Collins RE, Dilliplaine K, Oggier M, Bluhm B, Gradinger R, Eicken H (2016) Crude oil infiltration and movement in first-year sea ice: Impacts on ice-associated biota and physical constraints. Coastal Marine Institute Annual Meeting, Anchorage, AK. **Speaker**.

Iken K, Danielson S, **Collins RE**, Cooper LW, Grebmeier JM, Stafford K, Mueter F, Hopcroft R, Kuletz K, Bluhm BA, Moore SE, Bochenek R (2016) AMBON – the Arctic Marine Biodiversity Observing Network. **Poster**.

Dilliplaine***** K, Oggier M, **Collins RE**, Eicken H, Bluhm B, Gradinger G (2016) Biological Influence and Impact of Oil Spills in Ice Covered Waters. Alaska Marine Science Symposium, Anchorage, AK. ***Speaker**.

Oggier M, Dilliplaine K, Eicken H, Bluhm B, Gradinger R, **Collins RE** (2016) Oil in ice: Evolution of pore space geometry occupied by crude oil. Alaska Marine Science Symposium, Anchorage, AK. **Poster**.

Collins RE and Ducluzeau AD (2015) Phylogenomics of Cold Adaptation. Polar Marine Science Gordon Research Conference, Lucca, Italy. **Poster**.

Collins RE (2015) Greenland Ice Microbiome Project. Northwest Glaciologists Meeting. Fairbanks, Alaska. **Speaker**.

Collins RE, Dilliplaine K, Oggier M, Bluhm B, Gradinger R, Eicken H (2015) Crude oil infiltration and movement in first-year sea ice: Impacts on ice-associated biota and physical constraints. Coastal Marine Institute Annual Meeting, Anchorage, AK. **Speaker**.

Dilliplaine K, Oggier M, Eicken H, Bluhm B, Gradinger R, **Collins RE** (2015) Preliminary Findings of an Oil-in-Ice Mesocosm Experiment. Alaska Marine Science Symposium, Anchorage, AK. **Poster**.

Collins RE (2014) Oil biodegradation potential of sea ice microbial communities. Alaska Oil Spill Technology Symposium, Fairbanks, AK. **Speaker**.

Collins RE (2014) Winter sea ice biology: the role of bacteria. Big Black Box Workshop: Marine ecological processes during the polar night. Fairbanks, Alaska. **Speaker**.

Collins RE (2014) Extremophilic -omics. The Origins and Evolution of Bacterial Genomes, Canadian Mathematical Society. Hamilton, Ontario. **Speaker**.

Collins RE (2014) Life on Ice: Microbial Evolution in the Cryosphere. AAAS Arctic Science Conference, Fairbanks, AK. **Speaker**.

Ducluzeau AL, Green JJ, **Collins RE** (2014) Some like it cold: towards cold adaptation. International Society for Microbial Ecology Meeting, Seoul, South Korea. **Poster**.

Firth E, Carpenter SD, **Collins RE**, Deming JW (2013) Bacterial survival in sea ice brines: salinity shifts and the cellular fate of compatible solutes. Polar and Alpine Microbiology Meeting, Big Sky, MT. **Poster**.

Collins RE, Amato P, and R Morgan-Kiss (2013) Session: Evolution of Psychrophilic Microorganisms. Polar and Alpine Microbiology Conference, Big Sky, Montana. **Session Organizer**.

Collins RE, Bradley A, and Wing B (2012) Session: The Molecular Foundations of Geochemical and Microbial Co-evolution. Goldschmidt Conference, Montreal, Canada. **Session Organizer**.

Collins RE, Deming JW (2012) hima : a meta-database of genomes and metagenomes from low- temperature environments. International Polar Year Science Conference, Oslo, Norway. **Speaker**.

Collins RE, Higgs P (2012) Testing the Infinitely Many Genes Model for the Evolution of the Bacterial Core Genome and Pangenome. Astrobiology Science Conference, Atlanta, GA. **Poster**.

Collins RE (2012) Hima: A Meta-Database for Genomes, Metagenomes, and Phenotypes from Cold Environments. Astrobiology Science Conference, Atlanta, GA. **Poster**.

Collins RE, Wing B (2012) Unraveling the Genetic Basis of an Ancient Geochemical Biomarker. Astrobiology Science Conference, Atlanta, GA. **Speaker**.

Collins RE, Wing B (2012) Unraveling the Genetic Basis of an Ancient Geochemical Biomarker: Sulfur Isotope Fractionation. Goldschmidt Conference, Montreal, Canada. **Speaker**.

Collins RE (2012) ddmp: a digital database of microbial phenotypes. Ocean Sciences Meeting, Salt Lake City, UT. **Poster**.

Collins RE and JW Deming (2010) Microbial evolution and the potential for horizontal gene transfer in sea ice. International Polar Year Science Conference, Oslo, Norway. **Speaker**.

Collins RE (2010) Proposal for an education and public outreach curriculum linking polar climate change and astrobiology. International Polar Year Science Conference, Oslo, Norway. **Poster**.

Collins RE (2010) Astrobiology and Bioinformatics: Past, Present, and Future. McGill University, Montreal, Canada. **Speaker**.

Collins RE (2010) Astrobiology and Bioinformatics. Computational Astrobiology Summer School, Honolulu, Hawaii. **Speaker**.

Collins RE, Merz H, and P Higgs (2010) Modeling Microbial Genome Evolution. Sharcnet Research Conference. York University, Toronto, Canada. **Poster**.

Collins RE and JW Deming (2008) Icy Evolution: Lateral gene transfer in the Arctic? Polar and Alpine Microbiology Meeting, Banff, Alberta, Canada. **Speaker**.

Anderson RA, Brazelton WJ, **Collins RE**, Ewert Sarmiento M, Fuchsman CA, Goldman AD, Harnmeijer JP, Lin M, Opatkiewicz AD, Som SM, and E Stueeken (2008) A course in the origin of life as a model for meeting the goals of an astrobiology curriculum. Astrobiology Science Conference, Santa Clara, California. **Poster**.

Som S, **Collins RE**, Schreiber BC, Montgomery DR (2008) Salts on Mars: New perspectives in planetary geomorphology and astrobiological implications. 59th International Astronautical Congress, Paper IAC-08-A1.6.12, Glasgow, Scotland. **Paper**.

Fuchsman CA, Brazelton WJ, **Collins RE**, Horner-Devine MC, Rocap G (2007) Vertical descent or lateral transfer? Unravelling the large number of whole-genome reciprocal BLAST hits between anaerobic, thermophilic Bacteria and Archaea. American Society for Microbiology General Meeting, Toronto, Canada. **Poster**.

Collins RE and JW Deming (2007) Lateral gene transfer in Arctic sea ice? Polar Marine Science Gordon Research Conference, Ventura, California. **Poster**.

Collins RE and JW Deming (2006) Persistence of Archaea in sea ice. Astrobiology Science Conference, Washington, DC. **Poster**.

Collins RE (2006) Sea ice algae of Saroma-ko Lagoon, Hokkaido, during winter. International Symposium on Okhotsk Sea and Sea Ice, Monbetsu, Hokkaido, Japan. **Speaker**.

Collins RE and JW Deming (2006) Archaea in Arctic Winter Sea Ice. American Society for Microbiology Northwest Meeting, Seattle, Washington. **Speaker**.

Collins RE, Carpenter S, Deming JW (2005) Microbial communities at very low temperatures in natural saline ice formations. NASA Astrobiology Institute General Meeting, Boulder, Colorado. **Poster**.

Collins RE and JW Deming (2005) Microbial abundance and community structure in the winter sea ice of Franklin Bay, NWT. International CASES Workshop, Winnipeg, Canada. **Poster**.

Miller L, Owens O, Papakyriakou T, Sutherland N, **Collins RE**, Mucci A, Deming JW (2005) A time series of the carbon budget in first-year sea ice. International CASES Workshop, Winnipeg, Canada. **Poster**.

Collins RE and JW Deming (2004) Potential changes in sea-ice microbial community composition during an Arctic winter. International Conference on Arctic Microbiology, Rovaniemi, Finland. **Poster**.

Collins RE and JW Deming (2003) Changes in sea-ice microbial community composition during an Arctic winter. Study of Environmental Arctic Change Open Science Meeting, Seattle, Washington. **Poster**.

Chowdhury J, **Collins E**, DeKock B, Ehlmann B, Grant D, Hannon M, Ibsen S, Kinnevan J, Krauser W, Litzenberger J, Marzullo T, and B Shepard (2003) Humans to Mars: the political initiative and technical expertise needed for human exploration of the red planet. NASA Astrobiology Institute General Meeting, Tempe, Arizona. **Poster**.

Expeditions and Field Work

I've spent more than 12 months in the field for various projects—mostly in the Arctic or other cold regions and supported HQP or collaborators participate in many expeditions.

Summer 2024: 2 weeks. Community Based Monitoring. Tataskweyak Cree Nation. 1 student. Collaboration with Stephan McLachlan (UM).

Summer 2024: Community Based Monitoring. Kitikmeot Sea Science Study. M/V Martin Bergmann. Kitikmeot Sea. Collaboration with Kristina Brown (UM).

Spring, Summer, Fall 2024. Lake Winnipeg Research Consortium. Lake Winnipeg. Collaboration with Karen Scott (LWRC).

Spring, Summer, Fall 2024. Red River Watershed. With 2 students.

Spring, Summer, Fall 2024. UM Wetland Mesocosms. With 2 students. Collaboration with Mark Hanson (UM).

Spring 2024: 2 days. Community Based Monitoring. Chesterfield Inlet. 1 student. Collaboration with Nicole Wilson (UM).

Autumn 2023. FoxSIPP. CCGS Amundsen. 1 student. Collaboration with Brent Else (University of Calgary).

Summer 2023: 2 days. Field Course in Arctic Coastal Oceanography. M/V William Kennedy. Hudson Bay. With 22 students. Collaboration with CJ Mundy, Kristina Brown, Jens Ehn (UM).

Summer 2023: Community Based Monitoring. Kitikmeot Sea Science Study. M/V Martin Bergmann. Kitikmeot Sea. Collaboration with Kristina Brown (UM).

Summer 2023: 2 weeks. James Bay Expedition. M/V William Kennedy. Hudson Bay. 1 student. Collaboration with CJ Mundy, Zou Zou Kuzyk, Jens Ehn (UM).

Summer 2023. 4 weeks. Machias Seal Island Proejct. Bay of Fundy, Newfoundland. 1 student.

Summer 2023. KEBABB. CCGS Amundsen. Collaboration with Christine Michel (DFO). 1 student.

Spring, Summer, Fall 2023. Lake Winnipeg Research Consortium. M/V Namao. Lake Winnipeg. Collaboration with Karen Scott (LWRC).

Spring, Summer, Fall 2023. Red River Watershed. With 2 students.

Spring, Summer, Fall 2023. UM Wetland Mesocosms. With 2 students. Collaboration with Mark Hanson (UM).

Spring 2023: 2 days. Community Based Monitoring. Chesterfield Inlet. 1 student. Collaboration with Nicole Wilson (UM).

Summer 2022: 2 weeks. James Bay Expedition. M/V William Kennedy. Hudson Bay. 2 students. Collaboration with CJ Mundy, Zou Zou Kuzyk, Jens Ehn (UM).

Summer 2022. KEBABB. CCGS Amundsen. Collaboration with Christine Michel (DFO). 1 student.

Summer 2022. CBS-MEA. R/V Frosti. Collaboration with Andrea Niemi (DFO).

Spring, Summer, Fall 2022. Red River Watershed. With 2 students.

Spring, Summer, Fall 2022. Lake Winnipeg Research Consortium. M/V Namao. Lake Winnipeg. Collaboration with Karen Scott (LWRC).

Summer 2019: 2 weeks. NOAA Explorations, R/V Sikuliaq, Gulf of Alaska.

Summer 2018: 4 weeks. ASGARD, R/V Sikuliaq, Chukchi Sea, Alaska.

Summer 2017: 3 weeks. DBO-NCIS, CGC Healy, Chukchi Sea, Alaska.

Summer 2017: 3 weeks. AMBON, R/V Norseman II, Chukchi Sea, Alaska.

Summer 2016: 6 weeks. Hidden Oceans III, CGC Healy, Chukchi Borderlands, Arctic Ocean.

Winter 2016: 1 week. UNOLS Chief Scientist Training Cruise, R/V Thomas G. Thompson, San Diego, CA.

Summer 2015: 1 week. ARCTREX, R/V Norseman II, Chukchi Sea, Alaska.

Summer 2015: 5 weeks. AMBON, R/V Norseman II, Chukchi Sea, Alaska.

Summer 2014: 3 weeks. Arctic Science Partnership, Daneborg Marine Station, NE Greenland.

Summer 2014: 2 weeks. University Center in Svalbard, Longyearbyen, Svalbard.

Spring 2014: 6 weeks. Greenland Ice Microbiome Project, ski traverse of Greenland.

Spring 2014: 3 weeks. Greenland Climate Research Center, Nuuk, Greenland.

Winter 2014: 1 week. Barrow Arctic Research Center, Barrow, Alaska.

Spring 2013: 2 weeks. Barrow Arctic Research Center, Barrow, Alaska.

Summer 2010: 1 week. MARSLIFE, Pavilion Lake Research Station, British Columbia, Canada.

Spring 2008: 2 weeks. UW Oceanography, R/V Thomas G. Thompson, Glacier Bay National Park, Alaska.

Autumn 2007: 6 weeks. Circumpolar Flaw Lead Systems Study, CCGS Amundsen, Beaufort Sea, Canada.

Summer 2007: 1 week. Ocean Inquiry Project, Puget Sound, Washington.

Winter 2006: 2 weeks. Sea ice field course, Saroma-ko lagoon, Hokkaido, Japan.

Spring 2004: 1 week. UW Oceanography 101, R/V Barnes, Puget Sound, Washington.

Winter 2004: 6 weeks. Canadian Arctic Shelf Exchange Study, CCGS Amundsen, Beaufort Sea, Canada.

Summer 2003: 2 weeks. Chinese National Arctic/Antarctic Research Expedition, R/V Xuelong, Chukchi Sea.

Winter 2003: 1 week. NASA Astrobiology Institute Europa Focus Group, Barrow, Alaska.

Autumn 2002-2009: UW Astrobiology Workshops at Easton Glacier on Mt. Baker, the Mojave Desert Research Station, Mount St. Helens, San Juan Islands, Yellowstone National Park, University of Arizona Kitt Peak Observatory, and the Channeled Scablands.

Professional Development

Centre for the Advancement of Teaching and Learning, University of Alaska Manitoba (2019–2024) Workshops attended: • Indigenous Summer Institute (6 weeks) • Working with kamada wi ziyat (People who are Gifted) • Instructor Well-being and PERMA: Relationships • Instructor Well-being and PERMA: Engagement • Teaching with Video • Instructor Well-being and PERMA: Positive Emotion • Supporting Indigenous Students in Remote Learning Environments • Centering Indigenous, Black, and Racialized Peoples' Stories in Teaching and Learning

iTeach Online Learning, University of Alaska Fairbanks (Fall 2017)
Participated in semester-long training modules to advance skills in online pedagogy.

UNOLS Chief Scientist Training Cruise, Thomas G. Thompson (February 2016)
Participated in 1-week research cruise to gain applied knowledge in running a research cruise. Chief Scientists: Al Devol, Evelyn Lessard

Workshop on Molecular Evolution, Marine Biological Laboratory (July 2011)
Participated in 10-day workshop on molecular phylogenetics and evolution. Director: Mitch Sogin

Computational Astrobiology Summer School, University of Hawai'i (August 2010)
Participated in 2-week workshop on computational modeling from the perspective of Astrobiology. Director: Kim Binsted

Field Techniques in Interdisciplinary Sea-ice Research, Saroma-ko, Japan (March 2006)
Participated in 10-day field course on sea ice research, followed by a presentation at an international sea ice symposium. Instructors: Hajo Eicken (UAF), Rolf Gradinger (UAF), Kunio Shirasawa (Hokkaido University).

NASA Ames Astrobiology Academy, Ames Research Center, California (Summer 2002)
Participated in a summer research and leadership academy. Director: Douglas O'Handley.

Professional Service

President of the American Society for Microbiology Alaska Branch (2017–2018)

US representative of the Circumpolar Biodiversity Monitoring Project (CBMP) Sea Ice Biota Expert Network, a function of the Arctic Council's Conservation of Arctic Flora and Fauna (CAFF) working group.

Member of the Association of Polar Early Career Scientists (APECS), and Research Activities Committee organizer for the APECS Polar Microbial Ecology Research Group (2010–2015).

Referee for quality journals in polar ecology, environmental microbiology, and molecular evolution: FEMS Microbiology Ecology, Environmental Microbiology, Aquatic Microbial Ecology, Marine Ecology Progress Series, Journal of Marine Systems, Aquatic Sciences, Polar Biology, BMC Genomics, Molecular Biology and Evolution, PLoS ONE.

Proposal referee for NSF Division of Polar Programs and NASA Exobiology.

Public Outreach

I consider science outreach an important part of my scientific development and have dedicated time to a variety of outreach activities, including giving demonstrations at museums and open houses, inside K-12 classrooms, and at sea. I have judged for science fairs and mentored 'at-risk' high school students conducting a science fair project. In partnership with the Centers for Ocean Sciences Educational Excellence–Ocean Learning Communities (COSEE-OLC), a fellow student and I designed and implemented an ocean sciences curriculum with a local grade school teacher, and I participated in workshops to improve my ability to communicate with citizen scientists. I developed a website to allow engaged amateurs to report and track crows banded by Dr. John Marzluff in the College of Forest Resources at the University of Washington. I have also written articles and shared photographs for publication in non-technical science forums, one of which was subsequently translated and published in Catalan.

Public outreach via web and social media:

Collins Lab Website, http://cryomics.org, 10,000 visits/year

Cryomics Twitter, http://twitter.com/cryomics, 298 followers

Collins Twitter, http://twitter.com/rec3141, 1601 followers

Cryomics Lab Google+ channel, 2500 visits/year

Cryomics Lab YouTube channel, 850 views/year

Computational Proficiencies

General: Perl, Javascript, PHP, HTML, XML, LaTeX, MySQL, Linux sysadmin, high-performance computing on large datasets, cloud computing on Amazon Web Services

Bioinformatics and Statistics: R, PRIMER, MATLAB, blast, BioPerl, Galaxy, KEGG, IMG, ARB, PHYLIP, PhyML, AMPHORA, MrBayes, fastDNAml, MUSCLE, mothur, DADA2, BaseSpace, DIAMOND, kraken, SPAdes, RAST, MG-RAST, BioLinux distribution

Web-accessible Software Products

All of the analytical software written in the Collins lab is freely released under open source licenses to be shared, modified, and re-used by the scientific community.

http://github.com/rec3141 [20 repositories]

An award-winning visualization framework for microbial diversity and phenotypes

SEDNA: `http://cryomics.org/sedna`

Two experimental web-accessible databases provide access to information on cold-adapted microbes. HIMA is a phylogenetic-based meta-database of genomes and metagenomes from low-temperature environments. DDMP is a MySQL database of phenotypic information for cold-adapted bacterial species data-mined from Bergey's Manual of Systematic Bacteriology.

hima: `http://cryomics.org/work/hima`

ddmp: `http://cryomics.org/work/ddmp`

Two web-accessible programs were written to aid in fingerprinting analyses of complex microbial communities, gaining frequent use both within the Center for Environmental Genomics and by external users.

REPK: `http://rocaplab.ocean.washington.edu/tools/repk`

Dakster: `http://rocaplab.ocean.washington.edu/cgi/dakster/index.html`

Two interactive web-accessible databases were engineered to facilitate data-sharing both among scientists and between scientists and the public. The Lab Sampling Database will make information about my sampling efforts easily accessible to the public and to other scientists with whom collaborations might be initiated.

Collins Lab Sampling Database: `http://cryomics.org/grimp/tracker`

Seattle Crow Project: `http://depts.washington.edu/uwcrows`